

Remarks/Arguments

Claims 1 and 11 to 21 are pending in the application. Claim 2 has been amended to correct a clerical error. It is believed and intended that no new matter has been added by this amendment. Reconsideration and allowance of all claims are respectfully requested in view of the following remarks.

I. Election/restrictions

The Applicant thanks the Examiner for his confirmation of the Applicant's election.

II. Specification Objection

In response to the Examiner's citation of 37 CFR 1.75(d)(1), the Applicant maintains that the phrase "active damping element" **finds clear support in the description** in figure 8, item 800; figure 9, item 900; and the accompanying text. Further clarification is provided in paragraph 053. A person skilled in the art would understand the meaning and interrelation of the following terms: feedback, control, vibration damping, active damping and passive damping. That skilled person could not fail to understand that either item 800 or item 900, where items 714 and 770 are included as per the existing description, form such an "active damping element". MPEP section 608.01 states "...While **an applicant is not limited to the nomenclature used in the application as filed**, he or she should make appropriate amendment of the specification whenever this nomenclature is departed from by amendment of the claims so as to have clear support or antecedent basis in the specification for the new terms appearing in the claims." Paragraph 053 has been

amended to reflect the claim amendments. The Examiner is respectfully requested to withdraw the corresponding allegations against the specification.

III. Claim rejections under 35 U.S.C. § 112

The Examiner has maintained his 35 USC s. 112 objection to claims 14 through 21 on the grounds that it is unclear ‘whether the applicant intends to claim mass 714 or 750.’ The applicant has previously stated that the embodiment described in relation to figure 7 incorporates a mass (714) coupled to a hub (705) via two paths: (i) spring 712 and (ii) outer ring 750, spring 752 and the electromagnetic bond formed between sheath 770 and ring 714. Now, in completing the second coupling path, **the outer ring 750 is rigidly affixed to hub 705**. The original description clearly states this at **paragraph 044, lines 3 and 4**. Further related information exists in paragraph 041. Thus, there can be no mistaking the meaning of claim 14: it refers to **two paths of coupling** as discussed in the description and shown in the related figures. The Examiner has maintained that, according to figure 7, there is no coupling between 705 and 714 via 752. However, if the Examiner would **review the aforementioned text, paragraph 044**, which establishes the portion of the path not shown in figure 7, the Applicant believes that the Examiner will recognize the existence of that second coupling path, and, consequently, understand the significance of mass 714. The Examiner is respectfully requested to withdraw the corresponding 35 USC s. 112 allegation.

IV. Claim rejections under 35 U.S.C. § 102

The Examiner has maintained his 35 USC s. 102(b) objection i.e. he maintains that claims 1, 11, 12, 14 and 17-20 are anticipated by US 3,637,169

(Tossman). The Applicant respectfully disagrees. The Examiner maintains, in response to argument, that the “active damping element” of claim 1 is equivalent to items 14, and 15 of Tossman. The Examiner has not fairly considered the meaning of “active damping”.

Active damping of vibrations is a concept well understood in the art of control theory. For example of one patent that relies heavily on this concept, the Applicant refers to US 5,459,383.

Simply put, damping of oscillations may be conceptually divided into two categories: active and passive. Passive damping refers to any damping of oscillations which may be modeled upon a second order linear differential equation of the form:

$$Ax'' + Bx' + Cx = 0$$

By contrast, active damping systems may not be modeled by such equations, since the behavior of the system is governed by feedback inputs i.e. the systems are also functions of $x-\Delta x$, where Δx is the delay due to feedback; those feedback inputs are introduced to mitigate the vibrations and establish control. Thus, these systems are designated as active, since they are actively responsive to the vibrations. It is feedback and control which distinguishes the active dampening from passive dampening. The Applicant is entitled to the use of the term, which was introduced in original paragraph 053.

As can be seen from the description, where it centers on figures 8 and 9, active damping involves measurement, feedback and, ultimately, when feedback is applied to the measured variable, control of a vibrational system. Tossman 14, 15

do not comprise an active element simply because there is no provision to alter any spring constant associated with 14, 15 in response to a real time rotational measurement taken. For this reason claim 1 distinguishes over Tossman.

The Examiner, with respect to claim 11, and in response to our previous arguments, states that Tossman "is using the angular momentum, which is the result of angular velocity and mass, to control the damper." The Applicant disagrees. Tossman is using the angular momentum, which is the result of angular velocity and mass, to passively dampen nutation. Tossman has no accelerometer since no accelerometer is required for passive dampening. Passive dampening is achieved by the feedback-less interaction of a system in motion coupled to passive damping elements. As a result of this coupling, natural relationships form according to the aforementioned passive formula. However, this type of formula by no means implies that the variables themselves are measured by a sensor. No sensor is required. Thus it is no coincidence that Tossman does not supply one.

An accelerometer is a sensor. It senses acceleration. A person skilled in the art would understand given the guidance of the description, and taking elective dimensions, how to configure the calculations used in items 800 or 900 to derive angular velocity from the acceleration. An accelerometer is a transducer. It has as an input, acceleration. It has, as an output, some more useful physical attribute in a magnitude that bears a known relationship to the magnitude of the input. Typically, the outputs are current or voltage. Nothing in Tossman fits this description.

Further, insofar as claim 11 calls for the accelerometer to be coupled to a computer, Tossman again fails to provide. Nowhere does Tossman suggest a coupling by which angular information is communicated to a computer.

In his response to the Applicant's arguments, the Examiner fails to address the full ambit of Tossman deficiencies we allege. Specifically, the Examiner has noted that although Tossman 36 is a constant current generator, he has cited Tossman 14, 15. This is to misunderstand our point. Nowhere in Tossman is an adjustable current generator provided. Tossman 14, 15 is not charged by an adjustable current generator. Rather, according to the description, it's coils 18 may be energized or not. There is no provision for an adjustable generator for coils 18. The specification provides the minimum meaning to the adjustable generator of claim 11: Generators 898 and 998 are responsive to command signals. In any event, a person skilled in the art would expect that adjustable means more than 'on/off'. Tossman 36, which, in any event, is not coupled to the coils 18 of magnetic structures 14, 15, does not cure the deficiency.

Furthermore, Tossman in no way provides for the final paragraph of claim 11. This paragraph may be summarized as referring to the feedback mechanism. The element 'detects at least one undesired torsional vibration'. The Apparatus of Tossman does not detect. The Tossman apparatus is based on the assumption of the existence of undesirable nutations and passive dissipation. According to Tossman, tuning may be used to adjust when the nutation frequency changes. However, detection is not part of the apparatus. Detection is left to the operator.

Further, Tossman does not provide for 'signaling current generator to adjust

current'. Tuning is left to the operator. The Examiner may contend that these discrepancies are mere computerization. However, the Applicant cannot agree. These features are integral to the feedback system of the invention. It is by way of these features that a skilled person may understand that the subject matter is directed to a system incorporating feedback. Conversely, Tossman does not teach feedback. For all these reasons claim 11 distinguishes over Tossman.

Having regard to claim 14, the Examiner has, again, maintained an objection. The Examiner equates the pre-tuning of Tossman with step (iii) of claim 14. Again, the Applicant disagrees. The Apparatus of Tossman does not calculate current changes since there is no means to apply current changes. The calculation of Tossman may yield a binary decision to energize, or not, coils 18, or a binary decision to energize coil 36, or not. These are on/off decisions, not current changes.

Further, the pre-tuning of Tossman is inconsistent with step (iii) because of the clear order imparted by the particular order of claim 14. That order is not consistent with Tossman. In Tossman the order of events are (1) assume two spin rates (2) Calculate magnetic fields associated, for the two spin rates, with a nutation damper, (3) build the damper with provision (two position operator switchable magnetic fields) for damping nutations at the two spin rates, (4) identify which spin rate is occurring and therefore which undesirable nutation may be occurring, (5) switch the magnetic field value to correspond to the undesirable nutation.

Thus, it can be seen that step (iii) the calculations of claim 14 are subsequent to step (ii) the identification, whereas for Tossman the reverse is true. Again, this is of no mean import, since it goes to the control nature of the Applicants system:

calculations in a feedback system are responsive to system variables, not predictive of those variables. The Applicant maintains that, when properly construed, step (iii) cannot be found in the reference. For both these reasons claim 14 distinguishes over Tossman.

Since the remaining accused claims 12 and 17 to 20 depend from the aforementioned claims, the Examiner is respectfully requested to withdraw the corresponding 35 USC s. 102(b) allegation and allow these corresponding claims.

V. Claim Rejections under 35 USC s. 103

Since US 6,598,717 does not cure the aforementioned deficiencies of Tossman, the Examiner is respectfully requested to withdraw the corresponding 35 USC s. 103(a) allegation and allow dependant claims 13 and 21.

VI. Allowable subject matter

The Applicant gratefully acknowledges the Examiner's indication that claims 15 and 16 contain allowable subject matter. The Applicant respectfully requests postponement of the Examiner's requirement that claims 15 and 16 be rewritten in independent form until such time as the Examiner has reviewed and commented upon the present amendments and remarks.

VII. Clerical Error

The Applicant acknowledges the typographical error in claim 2 and submits a corresponding amendment.